CS 310H   Computer Organization and Programming   Spring 2010
Professor Fussell   Due: Mar. 4, 2010
                              Assignment #5

Instructions: The assignment is due on the date shown above. Tips to remember: give the assignments to your TA in section, remember your name, section number, TA name, and assignment number (5 points). Also, make sure your assignment is neat, stapled, and is entirely **your own work**.

1. P&P 4.5

2. P&P 4.7

3. P&P 4.8

4. P&P 4.16

5. For each of the following base-10 numbers, show how it would be represented in IEEE single-precision floating-point format. Note that you only need to show the first 10 most significant digits of the mantissa field (not all 23).

   (a.) 37.55

   (b.) 0.6

   (c.) 5,000,000,401

   With floating point numbers, explain how it is possible (using an example) that $a + b = a$, even though $b \neq 0$.

6. Consider a half-precision floating point format with 1 bit for sign, 7 bits for exponent (in excess 63 notation), and 8 bits for the mantissa. Perform the following floating-point calculations and express the result as a 4-digit hex representing a 16-bit half-precision number. You are to emulate a binary computer in this problem, so show your work for the different steps of the calculations - you may perform your calculations in binary scientific notation for simplicity. Check your work by showing the inputs and outputs in decimal.

   (a.) x4280 + x4280

   (b.) xC590 + xBE80

   (c.) x41C0 * xC080